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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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| 09 883,795 | 06 18 2001 | Leonard Forbes | 303.355US4 | 3129 |

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EXAMINER

DOAN, THERESA T

ART UNIT PAPER NUMBER

2814

DATE MAILED: 04/29/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/883,795

Applicant(s)

FORBES ET AL.

Examiner

Theresa T Doan

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 03 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on 24 March 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☐ Claim(s) 24-26 and 30-61 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☐ Claim(s) 24-26 and 30-61 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 13
- 4) ☐ Interview Summary (PTO-413) Paper No(s) _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other _____

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 24, 30, 32-33, 37-38, 42-43, 47-48, 52-53 and 57-58 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hori (5,604,357) as previously cited.

Hori teaches in figure 7(e) a method of forming a floating gate transistor comprising:

- forming a source region 2 and a drain region 3 in a silicon substrate 1;
- forming a gate insulator 15 comprising silicon dioxide (column 15, lines 2-3) on a channel region in the substrate between the source region and the drain region; and
- forming a floating gate 11a comprising a floating gate material selected from the group consisting of gallium nitride (GaN) and gallium aluminum nitride (GaAlN) (column 7, lines 64-67), such that the floating gate is isolated from conductors and semiconductors:
 - forming a silicon dioxide intergate insulator 13a on the floating gate 11a (column 15, lines 2-3); and
 - forming a control gate 11b on the intergate insulator.

Although Hori does not explicitly show a floating gate and a control gate, "the floating gate and the control gate" are a label that does not structurally distinguish over "storage regions" in Hori's device; the "storage regions" wherein storing and processing information which is carried out corresponding to the distribution ratio of conductive carriers functions as a memory part (column 6, lines 35-65 and column 15, lines 23-28). Therefore, Hori teaches "storage region" layer functions as "a floating gate and a control gate". Labels, statements of intended use, or functional language do not structurally distinguish claims over prior art, which can function in the same manner, be labeled in the same manner, or be used in the same manner. See *In re Pearson*, *Ex parte Minks*, and *In re Swinehart*.

3. Claims 25-26, 31, 34-36, 39-41, 44-46, 49-51, 54-56 and 59-61 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hori (5,604,357) in view of Major et al. (6,130,147) as previously cited.

Hori teaches substantially the entire claimed structure as applied to claims 24, 32, 37, 42, 47, 52 and 57 above, except for depositing the floating gate material by metal organic chemical vapor deposition (MOCVD) and further comprises forming the floating gate by plasma-enhanced molecular beam epitaxy (PEMBE).

Major et al. teach growing gallium nitride (GaN) in a horizontal reactor from an ammonia (NH₃) source gases that using a method of metal organic chemical vapor deposition (MOCVD) and further comprises forming layer by plasma-enhanced

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molecular beam epitaxy (PEMBE) (column 5, lines 1-10) in order to increase the cracking efficiencies of ammonia.

Given the above teaching, it would have been obvious to one having ordinary skill in the art at the time of the invention was made to combine the Hori structure using the method of Major in order to increase the cracking efficiencies of ammonia.

Double Patenting

4. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and, *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

5. Claims 24-26 and 30-61 are rejected under the judicially created doctrine of double patenting over claims 22-24 of U. S. Patent No. 6,031,263 since the claims, if allowed, would improperly extend the "right to exclude" already granted in the patent.

The subject matter claimed in the instant application is fully disclosed in the patent and is covered by the patent since the patent and the application are claiming common subject matter, as follows: both U.S. Patent and instant application claim a DEAPROM and transistor with gallium nitride or gallium aluminum nitride gate

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comprising a gate insulator. Moreover, the claim 22 in the U.S. No. 6,031,263 is either broader version of the claims of the instant application or are obvious variations thereof. For example, claim 22 in U.S. No. 6,031,263 "... a gate insulator from the gate insulator material" whereas claim 24 in the instant application claims "... a gate insulator comprising silicon dioxide on a channel region in the substrate between the source region and the drain region." Although the conflicting claims are not identical, they are not patentably distinct from each other because it would have been obvious to one having ordinary skill in the art to make a gate insulator of U.S. Patent No. 6,031,263 with silicon dioxide because silicon dioxide is a well-known material in the semiconductor industry to be used for insulating purpose.

Furthermore, there is no apparent reason why applicant was prevented from presenting claims corresponding to those of the instant application during prosecution of the application which matured into a patent. See *In re Schneller*, 397 F.2d 350, 158 USPQ 210 (CCPA 1968). See also MPEP § 804.

Response to Arguments

6. Applicant argues that "the Office Action states that "Hori does not explicitly show a floating gate and a control gate"; the Office Action has not stated specifically how Hori is being modified to reject claims". However, "the floating gate and the control gate" are a label that does not structurally distinguish over "storage regions" in Hori's device due to the "storage regions" wherein storing and processing information which is carried out corresponding to the distribution ratio of conductive carriers functions as a memory part

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(column 6, lines 35-65 and column 15, lines 23-28). Therefore, Hori teaches "storage region" layer functions as "a floating gate and a control gate".

7. Applicant argues that "none of the combinations shown by Hori include either GaN or GaAlN and SiO₂". The argument is not persuasive because Hori teaches in figure 7(e) a gate insulator 15 comprising silicon dioxide (column 15, lines 2-3) and a floating gate 11a comprising a floating gate material selected from the group consisting of gallium nitride (GaN) and gallium aluminum nitride (GaAlN) (column 7, lines 65-67).

8. Applicant argues that "Major does not supply the elements missing in Hori". The argument is not persuasive; although, Hori does not teach depositing the floating gate material by metal organic chemical vapor deposition (MOCVD) and further comprises forming the floating gate by plasma-enhanced molecular beam epitaxy (PEMBE). However, Major et al. teach growing gallium nitride (GaN) in a horizontal reactor from an ammonia (NH₃) source gases that using a method of metal organic chemical vapor deposition (MOCVD) and further comprises forming layer by plasma-enhanced molecular beam epitaxy (PEMBE) (column 5, lines 1-10) in order to increase the cracking efficiencies of ammonia.

The rest of applicant's arguments, addressed to the amended claims are considered in the rejections shown above.

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Theresa T Doan whose telephone number is (703) 305-2366. The examiner can normally be reached on Monday to Thursday from 8:00AM - 6:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, WAEL FAHMY can be reached on (703) 308-4918918. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 308-7722 for regular communications and (703) 308-7724 for After Final communications.

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Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

TD
April 23, 2003

Crowman
STAT. CL.
PRIMARY EXAMINER